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# Soil and Water Conservation News

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## Comments: From the SCS Chief

### The Soil Conservation Service—A Tradition of Excellence

When I became Chief of the Soil Conservation Service a year ago, I was convinced that SCS was one of the best agencies in the Federal Government, and I'm even more convinced of that today!

Thanks to the dedication and professionalism of SCS employees across the country, no other agency uses its resources more wisely or for a better purpose.

Over the past year, SCS has reconfirmed its strong working relationship with conservation districts, State soil conservation agencies, and other Federal agencies. SCS technicians have worked one-on-one with hundreds of thousands of landowners in advising them on ways to protect the soil and water resources on their farms and ranches.

In 1985, working through conservation districts, SCS helped farmers and ranchers apply soil and water conservation practices and systems that reduced soil losses by more than 230 million tons and conserved almost a million acre-feet of irrigation water.


The National Range Conference that SCS cosponsored last fall helped focus attention not only on erosion and other problems on rangeland and improved pastures, but also on many opportunities for improvement and multiple use of these vast resources.

This spring, SCS sponsored a joint seminar with the predominantly black 1890 Land Grant Institutions and Tuskegee University. This is a first step in working more closely with these institutions to improve the delivery of SCS assistance to low-income, minority farmers and ranchers.

We can all be especially proud of SCS efforts in helping to design the conservation title of the 1985 Food Security Act. The conservation title of this landmark legislation promises to have far-reaching effects in the future conservation of soil and water resources. I appreciate the teamwork of SCS field staffs in helping to implement the new law.

As SCS faces tough decisions in meeting budget and other constraints, I assure you that our goal is to maintain adequate field staffs to work with farmers and ranchers through conservation districts.

Employees in SCS are an example of what's right with government. Amid the serious challenges we'll face in the months ahead, I know that all of us will continue the longstanding SCS tradition of excellence.



**Cover:** Canada geese, Berkshire County, Mass. See articles about managing natural resources for wildlife beginning on page 7.

## NACD Holds 40th Convention

**T**he president of the National Association of Conservation Districts (NACD), Clarence Durban, issued a challenge to some 2,000 members attending NACD's 40th annual convention, February 2-6, in Nashville, Tenn. He said that 1986 is a time to move forward with soil conservation programs rather than give in to "dooms-day" talk and anticipated budget cuts.

Durban said conservation programs stand at the crossroads: on one side are the budget cutters who will try to reduce conservation budgets, the "nay-sayers" who believe nothing can be done to prevent the cuts, and the "gloom and doom" people who believe nothing can be done to help restore the vitality of agriculture.

"On the other side, I see a team of dedicated people, hundreds of thousands strong, who are committed to protecting this thin layer of soil that provides for all we have," emphasized Durban.

The conservation leader identified the four components of the team that will lead the conservation movement in the future as the conservation district officials, Federal agencies and legislators, State agencies and legislators, and agribusiness.

"You don't get the recognition you deserve," he told convention delegates, "but you are the backbone of the soil conservation programs in this country. Your dedication has seen the soil conservation movement through some difficult times in the past 40 years. There are more ahead of us, but I know that your perseverance will see us through these difficult times as well.

"The strength of the team—district leaders, Federal workers, and State agencies and organizations—is shown in the 50-year history of conservation accomplishments, and in 1986, it is shown in the conservation title of the 1985 Farm Bill," Durban pointed out. In that bill is some of the strongest language ever adopted by Congress in dealing with soil conservation.

"Along with the breakthrough will come new responsibilities for you as district officials," he emphasized. "We have asked for the challenge of the new programs such as the conservation reserve, nonpoint source pollution control, and urban sediment control. Now it is our turn to show that the work can be accomplished and that there will be positive effect."

At the convention, Durban outlined key issues for 1986 to the NACD Board. They include implementation of the conservation reserve, ensuring that the Federal Government provides technical assistance in every conservation district, strengthening State conservation agencies, increasing the recognition of district officials, interacting with other national interest groups, and encouraging the business community to take a more active role in soil conservation issues.

Two leading Tennesseans addressed the opening general session of the convention. Congressman Ed Jones and Lieutenant Governor John Wilder both challenged the attendees to continue to let Congress and the Administration know that soil and water conservation issues will continue to be as important to farmers and other landowners in the future as in the past.

Jones told the conservation leaders that "our close relationship has been mutually beneficial, resulting last year in the enactment of major new conservation initiatives and reforms." Jones told NACD members that "your long-term presence in Washington has given great strength, great stability, and great credibility to our legislative efforts."

Following the theme "use without abuse," Lieutenant Governor Wilder said conservation district work has always stood for conservation self-development and local government. "We must continue to develop programs that permit use of the land while making it better for the future," he said.

Wilder stated that the United States should develop programs to produce and deliver quality merchandise at competitive prices, and be a consistent supplier with the help of the Federal Government.

At the convention, NACD recognized six outstanding conservationists who have

made a national contribution to the conservation cause:

- Walter N. Peechatka, executive vice president of the Soil Conservation Society of America, received the Distinguished Service Award.
- Kenneth J. Roehrich, Hackettstown, N.J., received the Special Service Award.
- Merlind "Bud" Lennoye, executive vice president of the North Dakota Association of Soil Conservation Districts, received the Professional Service Award.
- Taylor Brown, farm director of the Northern Ag Network, Billings, Mont., received the Communications Award.
- Pioneer Hi-Bred International, Inc., received the Business Conservation Leadership Award.
- George B. Wolff, past president of the Pennsylvania Association of Conservation District Directors, received the Special Recognition Award.

## Soil and Water Conservation Research in Progress

The Soil Conservation Service works closely with USDA's Agricultural Research Service (ARS) in determining agricultural research needs, setting priorities, running field tests, and helping landowners and land users apply the results. Following are descriptions of some soil and water conservation research projects that were underway at ARS laboratories in December 1985:

- ARS researchers at the Soil & Crop Management Research Laboratory at Bushland, Tex., developed a reduced-tillage system for growing furrow-irrigated grain sorghum in the southern High Plains that may also prove successful with irrigated corn. The system increases the space between plant rows from the usual 10 inches to 30 inches and water furrow spacing from 40 to 60 inches. Grain yields using the wide-bed reduced-tillage system were 5 percent higher than with conventional tillage, and costs were reduced \$3.50 per acre. For more information contact Ronald Allen (806) 378-5738.



- Conventional furrow irrigation for dry bean production in the West often wastes water and causes severe soil erosion because fields are typically irrigated until the entire surface is wet. By irrigating only long enough for the water to reach the end of the furrow and then planting the bean seed in the bottom of the furrow a few days later, ARS researchers at the Soil Management and Water Quality Laboratory at Kimberly, Idaho, reduced the quantity of water applied for preplanting by 60 percent. Further, by limiting irrigation to the furrows where the beans were growing, total water applied was reduced 42 percent without affecting yields. For more information contact Robert Berg (208) 423-5582.
- An ARS project to test economical and reliable methods for predicting salt accumulation in soil has been funded by SCS. Field testing is being done in the San Joaquin Valley, Calif. Scientists are testing new instruments that are fast and easy to use and provide reliable data on a large scale. Salt accumulation is a potential danger on all irrigated cropland; in California alone, up to 1 million acres are starting to show damage. Soil salinity data for large areas will make it possible to map potential problem areas and reduce or prevent problems through proper management. For more information contact James Rhoades at the U.S. Salinity Laboratory at Riverside, Calif., (714) 683-0170.
- Annual soil erosion on a 6.7-acre southern Piedmont watershed with an average slope of 4 percent was reduced from 25 tons to 0.002 ton per acre over a 10-year period through a combination of conservation tillage and double cropping. Runoff was reduced from 18 percent to 0.5 percent of annual precipitation. ARS researchers at the Southern Piedmont Conservation Research Center at Watkinsville, Ga., gradually converted the watershed from soybean monocropping to wheat/soybean double cropping, balancing row crops with closely spaced small grains. They changed rotations in response to problems with weeds, soil erosion, yield decreases, and nitrogen costs. For more information contact George Langdale (404) 769-5631.

- Researchers at the Coastal Plains Soil & Water Conservation Center at Florence, S.C., found that a collapsible fabric dam that controls water levels of both a stream and its adjacent ground water table may help farmers in Mid-Atlantic States overcome seasonal droughts. Water pumped from behind a collapsible dam supplied eight center-pivots, four volume guns, and one subirrigation system. Moreover, the raised water table sustained crop growth on nonirrigated parts of a 2,000-acre study area. Raising the water table also reduced the amount of subsurface drainage, thus reducing entry of nitrates into streams by 50 percent. For more information contact Coy Doty (803) 669-5203.
- Researchers at the National Soil Erosion Research Laboratory at West Lafayette, Ind., and other locations have been working on a new method for predicting soil losses from the action of water. The method is scheduled to be released for testing in April 1989. Known as the USDA Water Erosion Prediction Project (WEPP), it will replace the Universal Soil Loss Equation, developed 25 years ago and now in wide use throughout the world. For more information contact G. R. Foster (317) 494-7748.
- In a project similar to the WEPP, ARS is involved in replacing the present Wind Erosion Equation. An ARS team of four agricultural engineers, three soil scientists, and one agronomist has been assigned to the project as well as a project coordinator. The wind erosion prediction system will be flexible in choice of area and time frame—from single to multiple fields and from single erosion events to crop-sequence periods for a number of years. For more information contact the project coordinator, George Cole at Kansas State University, Manhattan, Kans., (913) 776-2756.
- Germplasm of nitrogen-fixing legumes, some introduced from countries in Asia, Africa, and South America, is being tested at the Forage & Range Research Laboratory at Logan, Utah, in an effort to develop plants that can tolerate the semiarid conditions in the intermountain area of the western United States. Studies of the legumes thus far have helped in

improving seed production and adaptation and have increased information about the problems of the millions of acres of rangeland that get less than 12 inches of precipitation annually. Currently, all legumes that are well adapted to low rainfall areas are toxic to livestock. For more information contact Melvin Rumbaugh (801) 750-3077.

- No-till systems effectively control soil erosion and runoff. The lack of annual tillage creates changes in the topsoil and subsoil that may affect the amount and quality of water moving through the soil. Researchers at the North Appalachian Experimental Watershed, Coshocton, Ohio, are conducting experiments to find out where and how fast water travels through the soil under no-till conditions. Their work has shown that large vertically continuous worm holes may be significant channels for the rapid movement of some water through a crop's root zone. For more information contact William Edwards (614) 545-6349.
- Nitrate leaching to ground water can be controlled with information from an updated and expanded computer model called Nitrogen-Tillage-Residue Management. The model predicts the best nitrogen fertilizer practices for producing high crop yields, while protecting the environment from excess nitrate leaching. The model is also a valuable research tool. Results of tests that would take several years with standard field-plot techniques can be calculated in a few weeks using the model. Research on the model was done at the Soil & Water Research Management Laboratory at St. Paul, Minn. For more information contact M. J. Shaffer (612) 376-3669.

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Compiled from "Quarterly Report on Selected Research Projects of the Agricultural Research Service, October 1 to December 31, 1985."

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## Forum Held on the Future of Agriculture

The mega-trends in American agriculture mean it is on an irreversible course of change, but opportunities exist to make certain the agriculture of the future is more resource conserving and people supporting, said participants in a forum on the future of agriculture. The forum was sponsored by the American Land Resource Association on December 5, 1985, in Washington, DC.

"Policymakers working on the Farm Bill would benefit from an understanding of the mega-trends that are affecting agriculture today," asserted James Giltmier, assistant Washington representative for the Tennessee Valley Authority. Those include major changes in the marketing of farm products. Producers will have to become partners with food processors and produce "for markets that are really there, not those a grower hopes will be there," Giltmier said.

"We've been through the mechanization and the chemical revolution in agriculture," said Michael Phillips of the Congressional Office of Technology Assessment. "We're now entering the era of bio- and information-technology; . . . and biotechnology is one of America's major advantages in the international marketplace."

Another trend is the "bench-level" enthusiasm for nonchemical alternatives in agriculture that can keep farm costs low and make the whole farm system resource conserving, reflected Garth Youngberg, director of the Institute for Alternative Agriculture.

In the midst of these trends, opportunities exist for building an agriculture that is more resource conserving and supportive of human needs, panelists asserted. "We need to be more honest and plan for the consequences of technological changes," said Peggy Denker, deputy director of the Rural Coalition. Suggestions for positive action included:

- Developing separate Government farm programs for large, small, and subsistence growers, recognizing that each of these

categories has different objectives and needs;

- Moving away from the "hard tomatoes" era by directing publicly supported biogenetic research to improve the quality and nutrition of food as well as building more resource-conserving production systems;
- Correcting tax incentives to reward resource-conserving systems instead of subsidizing debt;
- Developing transitional programs for producers who are under great stress from the pressures of the changing system;
- Strengthening regional rural agencies, which can foster natural resource-based economic development to build the farm economy and provide job opportunities to those producers who move to part-time farming;
- Building information on low-input, diversified, resource-conserving farming systems into the public agricultural information process;
- Creating a revolving fund to buy agricultural land now being put on the market, developing conservation plans for the land, and reselling it with conservation requirements included in the land deed; and
- Providing protections and economic opportunities for farmworkers as technological changes affect their livelihoods.

"It is clear the agenda in agriculture is for change," said Kevin J. Coyle, president of the American Land Resource Association, "but we have some important choices facing us in the ways we go about managing that change."

Proceedings of this Forum are available, in an edited form, in the spring 1986 issue of the *American Land Forum* magazine. Contact the American Land Resource Association, 5410 Grosvenor Lane, Bethesda, Md. 20814.

## SCS Compiles Sample for Landowner Survey

District conservationists with the Soil Conservation Service helped a group of universities earlier this year to conduct a nationwide survey of landowners. The survey, the National Private Landowner Survey (NPLOS), dealt with types of land use, resource management practices, use of technical assistance, and other aspects of land management.

With the approval of the local conservation district boards, SCS district conservationists in 700 selected counties compiled a mailing list for the survey by consulting local tax rolls, which are public record. The universities then administered the survey, mailing questionnaires to more than 17,000 landowners in the 48 contiguous States.

The conservationist in each county—following procedures designed to obtain a random sample—selected about 25 landowners and listed their names and addresses. Only individuals owning 20 or more acres were to be listed. Individuals owning more than one parcel of land in the county were not to be listed more than once.

NPLOS is a joint project of nine universities: Clemson University, Clemson, S.C.; Cornell University, Ithaca, N.Y.; Duke University, Durham, N.C.; Mississippi State University, Mississippi State, Miss.; North Carolina State, Raleigh, N.C.; Oregon State University, Corvallis, Oreg.; Purdue University, Lafayette, Ind.; Stephen F. Austin State University, Nacogdoches, Tex.; and the University of Georgia, Athens, Ga.



# Farmers' Use of Conservation Tillage Still Growing

In 1985, farmers planted more acres in some form of conservation tillage than ever before—a total of 99.6 million acres—reports the Conservation Tillage Information Center (CTIC) in its fourth annual national survey of conservation tillage acreage. That's an increase of 2.8 million acres over last year, and nearly a third of the 316.9 million acres planted to crops in 1985.

More than 60 percent of the acres under conservation tillage are in the Corn Belt and Northern Plains States, and farmers are making the most increases in their use of conservation tillage methods on full-season corn and soybeans.

Conservation tillage is any tillage and planting system that maintains at least 30 percent of the soil surface covered by residue after planting to reduce soil erosion by water. Where soil erosion by wind is the primary concern, conservation tillage methods maintain at least 1,000 pounds of flat small grain residue equivalent on the surface during the critical erosion period.

The CTIC in Fort Wayne, Ind., is administered by the National Association of Conservation Districts as a special project in cooperation with agricultural industry, government agencies, private foundations, organizations, and farmers.

For the fourth year, the Center has compiled the "National Survey of Conservation Tillage Practices" based on data provided by the field staff of the Soil Conservation Service in cooperation with the Cooperative Extension Service, Agricultural Stabilization and Conservation Service, soil and water conservation districts, and agri-business.

Conservation tillage data were collected on a county-by-county basis and are broken down in the survey by conservation tillage method into 12 crop categories, which include full season and double crop categories for corn, soybeans, and grain sorghum. The different types of conservation tillage included in the survey were no-till, ridge-till, strip-till, mulch-till, and reduced till.

In 1985, according to the CTIC, the acreage under ridge-till increased 45 percent with more than 75 percent of that

increase occurring within the Corn Belt and Northern Plains States.

Iowa ranked first in total number of conservation tillage acres, with 12 million, a 2-million-acre increase over last year. Kansas ranked second.

Of Iowa's total conservation tillage acreage, 10.9 million acres was under mulch-till, making Iowa the leader in that category as well. Illinois ranked second in the number of mulch-till acres. Other top-ranked States are Illinois and Ohio for no-till, Nebraska and Minnesota for ridge-till, and Nebraska and Alabama for strip-till.

Reporting the highest percentage of acres under all methods of conservation tillage compared to the total planted acres in a State were Delaware and Maryland, first and second, respectively. Delaware reported 73 percent of its planted cropland under conservation tillage.

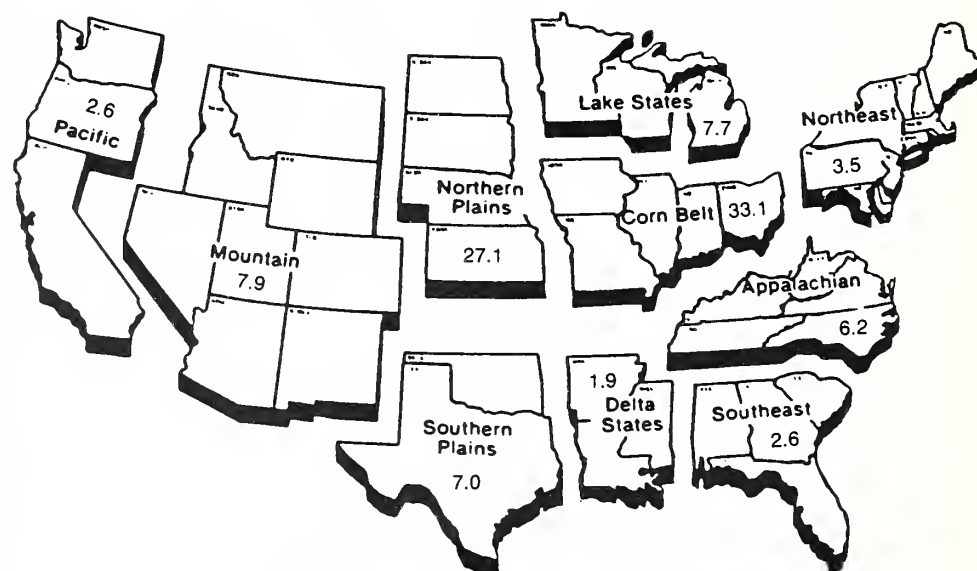
The Southern Plains Region recorded a significant increase in strip-till acreage this year while strip-till acreage in the Mountain

Region decreased by more than half.

The 1985 "National Survey of Conservation Tillage Practices" contains national totals, regional and State summaries, State/county summaries, and maps and pie charts. National and regional reports can be ordered in hard copy, on magnetic tape, or on floppy disks. Single State/county summaries and custom county summaries are available in hard copy or on floppy disk. Single State summaries without the county breakdown are available in hard copy only. A fee schedule is available on request from the Center at 2010 Inwood Drive, Executive Park, Fort Wayne, Ind. 46815, or telephone (219) 426-6642.

An executive summary of the report can be obtained from the Center at no charge. The summary contains only the national and State totals and their corresponding maps.

## All Conservation Tillage



All Crops—Acres in Millions (Total—99.6)



## Ducks by the Mcbucket

Wood ducks in Wake County, N.C., deserve a break today. And, with a little help from their friends, they're getting one.

The Wake Soil and Water Conservation District and local McDonald's Restaurants have teamed up to recycle empty pickle buckets into nesting boxes for wood ducks. The boxes are necessary because increased cutting of bottomland hardwoods in recent years has destroyed many natural wood duck nesting areas in the county.

Suitable artificial nesting structures can be built from wood or sheet metal, but these structures are expensive, time consuming to build, and bulky to transport. As a result, the district and the restaurants joined together in the fall of 1982 to produce an effective, economical, and easily transportable alternative to the old style structures.

The restaurants receive pickles in 5-gallon green buckets that are discarded once the pickles have been removed. When asked by the district, Wes Elam, who was then operations manager for the

Raleigh region of the restaurant chain, arranged for the 5-gallon buckets to be saved. The district collected the buckets and converted them into nesting boxes.

Each structure requires two buckets. The top rim of each bucket is modified so that one bucket fits over the other like a huge medicine capsule. A 3½-inch hole is cut on the side of the top half, and drainage holes are drilled in the bottom half. For nesting material, 6 to 7 inches of wood shavings are placed in the bottom. The structures are then attached to posts, steel pipes, or trees. Shields are erected to protect the nests from predators.

The pickle-bucket boxes have several advantages over other nesting boxes. Since the top and bottom halves are secured in a press fit, the structures can be disassembled in seconds. The halves can be stacked inside each other like paper cups for easy transportation.

In addition to donating the buckets, McDonald's has also helped with promotion. A display built by the district using a nesting box and photographs has been placed in several of the restaurants. The district has promoted the boxes

through local newspaper stories, personal contacts, and design sheets distributed at outdoor and farm shows.

The district sells the complete structures for \$8.95 each plus shipping. It uses the money it makes to finance a college scholarship fund that has already awarded two \$100 scholarships to students at North Carolina State University. Funds are also used for other educational programs in the public schools.

In 1983, the first year, 10 of the structures were installed around a pond in the southern part of the county. Wood duck hens nested in 9 of these and produced 106 ducklings. The following year, 300 ducklings were produced in 33 of the structures installed at adjacent ponds. An electric utility company purchased 20 boxes for use at Shearon Harris Lake. Thus far, 84 boxes have been sold.

**Larry Petrovick**,  
soil conservationist, Wake Soil and Water Conservation  
District, Raleigh, N.C.



Empty pickle buckets are recycled as nesting boxes for wood ducks in Wake County, N.C.



Wood shavings serve as nesting material.



## Wisconsin Launches Wildlife Enrichment Program

"Wildlife represents the difference between rich country and mere land. A thicket without the potential roar of a quail covey is only a thorny place," wrote an early conservationist, Aldo Leopold.

Nobody has to tell this to the farmers in Dodge County, Wis. Most remember when their land was rich and alive with an abundance of wildlife. And, by participating in a new wildlife program, many are determined to keep their farms from ever becoming just "mere land."

Dodge County is ridged from northeast to southwest with long glacial drumlins, interspersed with bulrush marshes and open water. This topography has historically provided ideal habitat for ring-necked pheasants, ducks, small game, and songbirds. In the late fifties, this habitat supported 30 to 50 pheasants per square mile. Now, with the drainage of many of the wetlands and the advent of new farming practices, only 3 to 18 pheasants per square mile remain.

To reverse this trend, an experimental project was started in 1984 to help Dodge County farmers re-enrich their land with wildlife. The Dodge County Private Lands Wildlife Project is a multiagency effort to encourage landowners to consider wildlife in their farming operations. Project managers hope to find and provide the right mix of cost-sharing, education, technical assistance, and communication necessary to reestablish wildlife habitat. Sponsors include the Wisconsin Department of Natural Resources (DNR), the University of Wisconsin-Extension, USDA's Agricultural Stabilization and Conservation Service (ASCS) and Soil Conservation Service, the Dodge County Land Conservation Department, and Wings Over Wisconsin (a sports club).

The project's feasibility is being tested in three areas. Pheasant and mallard counts in these areas will be compared for 6 years to counts in three similar control areas. If the project proves successful in Dodge County, plans call for it to be expanded to other areas of the State.

Since pheasants typically nest within 2

miles of winter cover, the study areas were drawn as circles, 2 miles in radius, centered on the winter habitat. Goals for each area are to establish at least 400 acres of nest cover, 30 acres each of cattail and shrub winter cover, 100 acres of duck brood water, and 4 to 6 acres of corn-sorghum food plots.

Pheasants require a mixed habitat to flourish: tall dense grass for nest cover, shrubby wetlands for winter cover, and a dependable supply of winter food. Mallards use the same type nest cover but also need a marsh with open water to raise their broods.

Maintaining quality duck wetlands will also help control soil erosion. Much of the land in the study is eroding at twice the rate considered the maximum acceptable. Project managers emphasize that by seeding the most erodible land to nesting cover, farmers can achieve both soil conservation and wildlife goals.

Most of the farms are dairy farms, but a few are in cash grain and vegetables. The average farm size is 180 acres.

In pre-project meetings, DNR Wildlife Biologist Todd Peterson and SCS District Conservationist Norbert Wozniak found that most of the farmers cared about wildlife but did not understand the causes of the decrease in wildlife populations,

especially the effects of new farming practices. For example, few realized the devastating effect of intensive land use on wildlife habitat. Farming every odd acre in large fields cleared of hedgerows leaves little room for wildlife.

Peterson hopes to enlist at least half the farmers in the study areas to participate. "The project is a community effort," he said, "and will succeed if just some people each do a little bit. One farmer may plant an odd area to switchgrass nest cover; another may put in a food plot near winter cover; another may not do anything. As long as the four vital components—nest cover, winter cover, winter food, and brood water—are available in sufficient quantity and quality, bird numbers should increase."

SCS is working with participants to develop conservation plans that emphasize wildlife management practices. "Because of the natural features in the area, the farmers here have a great opportunity to bring the wildlife back," said Wozniak. "We're just showing them the best ways to do it."

There are 253 farmers in the study areas. Wozniak said that by the end of 1985 project representatives had visited 53 of the farmers and 19 had applied one or more of the recommended practices.

Participating landowners are eligible for



Many farms in Dodge County, Wis., have excellent potential for wildlife habitat.

special cost-sharing and land rental funds from ASCS and DNR. The best incentive, however, may be seeing the pheasants and mallards return to their old territories. More than anything else, that will prove to the farmers that, with just a little effort, conservation pays in clean water, reduced erosion, and land that is richer in wildlife.

**Renee E. Anderson,**  
public affairs specialist, SCS, Madison, Wis.

**Thomas P. Thrall,**  
biologist, SCS, Madison, Wis.

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## Indiana Study Shows Birds Prefer No-Till

No-till in southeastern Indiana provides habitat for a greater variety of birds than does conventional tillage. According to a recent study, the birds find food and cover in the crop residue that no-till leaves on the soil to reduce erosion.

In a project sponsored in part by the Soil Conservation Service, bird populations were studied for 3 years in corn and soybean fields in Scott County. Data were collected from 36 fields—9 each of conventional cornfields, no-till cornfields, conventional soybean fields, and no-till soybean fields.

More bird species were sighted in the cornfields than in the soybean fields in all seasons. During winter, 31 bird species used fields covered with no-till corn residue while only about half that many used tilled cornfields and fields with soybean residue. Fields with the heaviest crop residues were the most attractive to most of the bird species. Only two—the horned lark and killdeer—avoided fields with heavy residue cover. These species favored fields of disked corn residue or no-till soybean residue but showed almost no use of plowed or chiseled fields.

During the spring nesting season, a total of 31 bird species—not all the same as those seen in winter—were observed in the study fields. Some of the no-till fields provided suitable habitat for successful reproduction of ground-nesting birds such as meadowlarks, bobwhite quail, field

sparrows, and song sparrows. One pair of yellow-throated warblers nested in a no-till cornfield with a cover crop of 'Emerald' crownvetch. Twice as many barn swallows were observed feeding over no-till fields than over tilled fields. Fall-sown cover crops of winter rye and wheat, which seem to offer little additional habitat in winter, are very attractive to nesting birds late in spring after there is substantial plant growth.

During the study, the percentage of ground cover was measured twice in each field, once before and once after spring planting. Crop residue left in the fields over winter varied from 0 to 100 percent cover, and averaged more for corn than soybeans. Residue cover was usually between 80 and 90 percent after 2 years of no-till corn. An aerially seeded cover crop of winter rye in corn residue usually increased the total cover to between 95 and 100 percent. Height of the residue cover, which is important to many species of birds and other wildlife, averaged 1 to 2 feet in the corn fields and about 4 inches in the soybean fields.

No-till leaves both waste grain and stalk residue. Waste grain is very important wildlife food during winter when food requirements increase and other foods are scarce. Some studies have shown fall

plowing buries 98 percent of the waste corn left after harvest. During the spring and summer, birds and small mammals feed heavily on seeds, insects, and grubs when extra protein is required for egg laying and the production of young.

The study was a cooperative project by the Indiana Department of Natural Resources (DNR), the Scott County Soil and Water Conservation District, SCS, and private landowners. "The study was successful," said John Castrale, DNR research biologist and one of the principal investigators, "because of the team effort of all individuals and groups involved. We now know with some certainty that no-till provides better wildlife habitat than moldboard plowing."

Bird species attracted to the fields include eastern bluebird, cardinal, robin, bobwhite quail, mourning dove, dark-eyed junco, American goldfinch, flicker, downy woodpecker, tree sparrow, song sparrow, American kestrel (sparrow hawk), and eastern meadowlark.

**James D. McCall,**  
biologist, SCS, Indianapolis, Ind.



During winter in southeastern Indiana, 31 bird species were observed in fields covered with no-till corn residue. Most birds are attracted by the food and cover provided by such heavy crop residues. The windbreak in the background provides diversity, another important requirement for wildlife.



## Rhode Island Farm Produces Wildlife

Rhode Island, known to its residents as "the biggest little State in the Union," offers a wide variety of farming. In addition to its potential for crop, livestock, and woodlot operations, the State offers good opportunities for wildlife management.

Take for example the Addieville East Farm in Burrillville, a 470-acre hunting and fishing preserve operated by Geoff Gaebe since 1979. What makes this farm different from most others is its emphasis on wildlife habitat development. Gaebe grows corn and switchgrass specifically for the use of wildlife. His farm has increased the populations not only of upland game birds in the area but also of predatory birds, foxes, otter, and other nongame wildlife.

Gaebe believes his type of farm is about the only type that now provides for wildlife the way most farms used to. "Wildlife depends on agriculture, but farmers have gotten so good at what they do and are under so much economic pressure that they can't afford to consider the needs of wildlife anymore," he said.

The Soil Conservation Service became involved when Gaebe contacted the Northern Rhode Island Conservation District for assistance in farm planning and wildlife habitat development for pheasants. Over the past few years, Gaebe has received assistance through the conservation district with upland wildlife management, woodlot management, pond design, runoff management, field stripcropping, renovation of hayfields, diversions and waterways, tile drainage, and an access road.

Gaebe's bird habitat includes open fields with feed patches, buffer strips, second-growth timber, and mature forest. He personally designed large flight pens around the farmhouse and barnyard area to keep pheasants in as natural an environment as possible while in captivity. The design of the pens allows him to move thousands of birds in 2 hours, a job that used to take 8 to 10 hours.

Sometimes as many as 20,000 pheasants are introduced into the 10 acres of flight pens. When this happens, the

birds strip all of the vegetation from the soil, which results in a high hazard of erosion. Incorporated into the design of the pens is a 2- to 4-foot-high screen that provides both a visual block to outside stimuli and predators as well as a very effective silt fence. The screen is made of porous fiberglass, a byproduct of the paper industry, and has proven very effective in controlling soil movement.

Because of careful design and management of the water resources on the farm, trout fishing is also an important aspect of the operation. Ponds designed with SCS assistance are kept well stocked with rainbow trout, and native brook trout can be found in a stream that crosses the property.

When asked about his plans for the farm, Gaebe said his plans have changed several times, taking new directions. One day soon he would like to raise beef cattle to utilize his hayfields. He is also looking into the possibility of producing birds that can survive in a woodland habitat rather than an agricultural habitat. Although the farm produces pheasants to sell to restaurants and cordwood to sell to homeowners, Gaebe said his main goal has always been an outdoor recreation facility based on hunting and fishing. He believes we will see more and more of this type of operation in Rhode Island and other States where the amount of uninhabited land is decreasing.

**Eric Scherer,**  
former district conservationist, SCS, Greenville, R.I.,  
now resource conservationist, SCS, Hartford County,  
Conn.

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## Improved Wildlife Habitat Spurs New Business

What began as an avocation has become a part-time occupation for farmer Bill Wolters. An avid hunter, Wolters recently converted 500 acres of his farm in Sussex County, Del., into a hunting preserve.

Opening the hunting preserve was a natural progression for Wolters, who has been cooperating with the Soil Conservation Service and the Sussex

Conservation District on erosion control and wildlife conservation practices for well over a decade. On the 3,000 acres where he raises corn and soybeans, he has installed nine ponds, miles of vegetative filter strips along drainage ditches, and acres of wildlife food plots.

Wildlife habitat development on Wolter's farm goes back to 1973. At that time SCS conservationists were looking for farmers willing to plant demonstration plots of VA-70 shrub lespedeza, a new shrub developed for erosion control and wildlife food and cover.

"We were finding that a lot of natural hedgerows and odd brushy areas were being removed as farmers tried to maximize the efficiency of their operations," said Dick Bennett, SCS district conservationist. "This was eliminating wildlife habitat and opening up fields to wind erosion. Shrub lespedeza seemed like a good solution to both problems."

Wolters agreed to plant the lespedeza along a newly cleaned out drainage ditch. He planted this first plot to control erosion and trap eroded soil and nutrients carried in runoff from the adjacent cropland. "With all the runoff and high-powered chemicals we're using, we've got to have these strips along every ditch or someday we won't be able to get a glass of clean water," he said.

Such strips also keep maintenance to a minimum by reducing the amount of sediment entering the ditch. "Unlike grass filter strips, shrub lespedeza doesn't have to be mowed," Bennett said. "Its dense foliage keeps trees and other woody plants from getting started. This makes cleanout, when it is necessary, a lot easier."

Shrub lespedeza, which grows 4- to 6-feet tall, is a perennial with a semiwoody stem. Its seed pods mature in October but can take weeks to shatter, making food available to wildlife well into the winter. The stems bend with the weight of snow, providing shelter for rabbits and quail.

The plant's performance and its potential for wildlife habitat development so impressed Wolters that he agreed to produce seed so that it would be available to others. "It is the best cover in the world

for wildlife," he said. "It provides nesting for rabbits and quail. Pheasants and doves love it."

During one season, Wolters harvested 260 doves and 40 quail from a 5-acre area bounded on three sides by shrub lespedeza. Today, in addition to having it along drainage ditches, he maintains a 10-acre plot of lespedeza in a 20-acre field planted with strips of other types of wildlife food plants such as buckwheat, sorghum, corn, and sunflowers. He is now a major commercial producer of shrub lespedeza seed.

In addition to birds such as pheasant, chuckers, and quail, which Wolters pen raises and releases, a wide variety of other species can be found naturally on his land. These include deer, ducks, geese, and doves.

The hunting preserve provides Wolters with a cash flow from September through midwinter, normally a period of lower farm income. Already drawing hunters from across the country, his preserve promises to be as profitable as his agricultural enterprises—if not more so.

"Less and less land is becoming available for hunting as more habitat is being taken out for agriculture," he said. "Office workers don't have time to look for a place to hunt, and young people are being denied the pleasures of the sport because they have no place to hunt and no one to teach them."

While good business sense played a part in his decision to use conservation practices, it wasn't his only motivation. Wolters is determined to conserve his natural resources and is convinced that conserving soil and developing wildlife habitat are compatible goals that more farmers should strive for. "Without erosion control," he said, "Americans are not going to have any farmland left."

**Katherine Gugulis,**  
public affairs specialist, SCS, College Park, Md.

## **SCS and Wildlife Heritage Team Up for Waterfowl**

On John K. Waters' farm, waterfowl is as important a crop as corn and soybeans. In fact, one of the reasons Waters moved last year to Easton, Md., near the Chesapeake Bay, was to hunt ducks and fish oysters.

He soon found—to his dismay—that an old goldfish pond behind his house attracted mosquitoes and frogs, but no ducks. So Waters turned to the Soil Conservation Service and a private group, the Chesapeake Wildlife Heritage, for help in building a pond that would attract waterfowl.

SCS and the Wildlife Heritage, through the Talbot Soil Conservation District, helped Waters develop a comprehensive plan for wildlife management. The plan includes recommendations for building a pond and fluctuating the water level to encourage plant growth and attract ducks.

The Wildlife Heritage has a fulltime interest in waterfowl habitat management and cooperates with SCS in developing detailed management plans for waterfowl. "When field personnel from SCS and the Wildlife Heritage visit a farm, we can help the landowner make decisions and come up with a management plan," said Paul Petrichenko, SCS district conservationist for Talbot County. "After planning has been accomplished, SCS engineers design a pond to meet the landowner's goals and the Wildlife Heritage helps implement the plan."

The primary interest of the Wildlife Heritage is creating habitat for dabbling ducks, and most of its clients are absentee landowners who don't have the time or expertise to manage their ponds for wildlife. The group helps to manage more than 25,000 acres of farmland and marshland in Maryland, as well as projects in Delaware and South Carolina.

"Our forte is implementation," said Ned Gerber, a biologist for Wildlife Heritage. "That means everything from helping the landowner get the proper permits, planting appropriate vegetation, and hiring a contractor to build the pond to putting up nesting boxes."

The nonprofit group raises funds through

a waterfowl festival and client donations. Gerber said donations average about 10 percent of the pond cost. "But we don't insist on that," he said. "If cost is a deterrent, we're more interested in getting the wildlife practices installed than in getting a donation."

Petrichenko and Gerber are pleased with the special working relationship between their organizations. "Our goals are compatible," said Petrichenko. "Ned's selling soil conservation just like we are because it improves water quality for waterfowl by keeping sediment and nutrients out of ponds and streams."

Most clients of the Wildlife Heritage request SCS help in developing complete soil conservation plans for their farms. Waters, like many farmers in the Chesapeake Bay area, is especially concerned about siltation. "I live at the head of the Miles River and every day I see evidence of siltation," he said. "Around our boat house at low water we barely have 2 feet of water where there used to be 6."

Waters plans to install grassed waterways to prevent erosion in his crop fields and to plant loblolly and yellow pine trees along the river to serve as a buffer strip. The pond will also help filter sediment and nutrients from the runoff before it reaches the river.

"Ponds act as a barometer of what is occurring in the environment," said Petrichenko. "If the pond begins to silt in and become filled with algae, it is bad for waterfowl. It also means that soil and nutrients are washing off the land. And if the pond is filling up with soil and nutrients, then you know the same thing is happening to the creeks that feed the larger rivers and the Chesapeake Bay."

**Katherine Gugulis,**  
public affairs specialist, SCS, College Park, Md.



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## New Publications

### Engineering Models for Agricultural Production

by Donnell R. Hunt

The technical level of this textbook is suggested as the beginning of the third year of a 4-year collegiate program. The book emphasizes the application of physical science and technology through mathematical modeling. It focuses on the importance of systems modeling in designing equipment and procedures to achieve efficient agricultural production.

Topics include mathematical modeling of field machinery systems, field operations, engineering economics, analogs, stochastic systems, calculus, scheduling, and game theory. Frequent problem sets and detailed modeling projects are provided.

This 260-page textbook is fully illustrated with photographs, tables, charts, and graphs.

Copies are available for \$37.50 from AVI Publishing Company, 250 Post Road East, P.O. Box 831, Westport, Conn. 06881.

### Warm-Season Grasses: Balancing Forage Programs in the Northeast and Southern Corn Belt

by the Soil Conservation Society of America

According to the seven plant experts who wrote this booklet, warm-season grasses are comparable or superior in forage quality to cool-season grasses. Supplementing cool-season forages with warm-season grasses can enhance livestock production and provide other benefits. The booklet explains how warm-season grasses can be used for wildlife plantings, reclamation, and other

conservation uses. The performance of these grasses and descriptions of breeding programs to develop better-adapted cultivars are also reviewed.

This booklet should be a useful guide to farmers and ranchers, conservationists, extension personnel, and others who work with landowners and managers.

Copies of this booklet are available for \$5 (\$4 for Soil Conservation Society of America members) from SCSA, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021-9764. (Discounts on quantity purchases are available.)

### Agricultural Topics for Science Fair Projects

by John A. Maday,  
University of Florida

This booklet was developed to encourage students to choose agricultural topics for their science fair projects. It consists of two parts. First is a list of faculty members from the University of Florida, Institute of Food and Agricultural Sciences, who have offered to serve as resource people for students planning science fair projects. Second is a list of questions, problems, or topics which could serve as a basis for a science fair project.

Single copies of this booklet are available from the Agribusiness Institute of Florida, Inc., Liberty Square, Suite 201, 1137 Bartow Highway, Lakeland, Fla. 33801.

### The Environment, Public Health, and Human Ecology: Considerations for Economic Development

by James A. Lee

As a development finance institution, the World Bank wants to ensure that consideration is given to the environmental, health, and social consequences of every development project proposed for financing and that potentially

adverse impacts are avoided or mitigated. The Bank has designed this handbook to provide guidance in the identification, detection, measurement, and control of adverse environmental effects. It is a general survey of the environmental, health, and human ecological impacts of development projects in sectors such as agriculture, industry, energy, and urban development (including water supply, sanitation, and transportation).

Chapter 1 describes the World Bank's policy of sustainable development and its internal project cycle review. Chapter 2 examines four environmental problems caused primarily by industrial and energy-related development projects: air pollution, water pollution, solid waste disposal, and noise pollution. The direct and indirect health risks to the inhabitants and workers in the project areas are discussed in Chapter 3. A discussion of some of the possible adverse effects of tropical agricultural development and ways to mitigate them is given in Chapter 4. Chapter 5 provides a framework for analyzing the environmental impacts associated with a wide variety of industrial development projects in developing nations. The environmental damage associated with the exploration, mining, and development of fossil fuels is discussed in Chapter 6; and Chapter 7 discusses the planning tools available for managing urban and regional development. The handbook concludes with two appendixes and a bibliography.

Project planners, government policymakers, economists, and lending officers in financial institutions should find this book useful.

This 288-page handbook is available for \$14.95 from the World Bank Publications Department, 1818 H Street, NW., Room H-2171, Washington, DC 20433.

### Baybook: A Guide to Reducing Water Pollution at Home

by the Citizens Program for the Chesapeake Bay

"Growing commercial, industrial, recreational, and urban activities in the Bay area are putting substantial pressure on the Bay's fragile ecology. It's time we stopped taking the Bay for granted." These statements are from a guide that was developed for the people who live in the 5 million households around the Chesapeake Bay.

A comprehensive study by the U.S. Environmental Protection Agency verified that the Chesapeake Bay has been seriously harmed by environmentally unsound decisions made in the past.

Since the Federal and State governments announced their plans to clean up the Bay, the public's enthusiasm to do its part has grown.

*Baybook* shows how families can make changes in daily household routines to help improve the quality of water flowing into the Chesapeake Bay, thus preserving and restoring the Bay. It gives information on erosion control, soils, drainage, septic systems, pavement, landscaping, lawns, gardening, household chemicals, water conservation, recreation, and community action.

The guide warns, "If we don't take steps now to improve the quality of the water in the Chesapeake Bay, the waters may one day be gone."

Single copies are available, while supplies last, from the Citizens Program for the Chesapeake Bay, Inc., 6600 York Road, Baltimore, Md. 21212. Readers are encouraged to reproduce all or parts of *Baybook* for use in citizen organization newsletters or as handouts at community meetings.